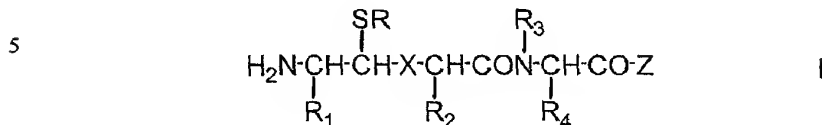


IFW → CIP of PCT  
Restor

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# US CLAIMS

1. A compound of general formula I :



wherein :

- R<sub>1</sub> denotes an alkyl, alkenyl or alkynyl chain, or a cycloalkyl or (cycloalkyl)alkyl group substituted by at least one
  - -COOH group, optionally esterified by an alkyl group comprising 2 to 12 carbon atoms,
  - SO<sub>3</sub>H group, optionally protected by a pentyl group,
  - PO<sub>3</sub>H<sub>2</sub> group, optionally substituted by a (-CH<sub>2</sub>CH<sub>2</sub>SCOR<sub>5</sub>) group, with R<sub>5</sub> representing a C<sub>1</sub>-C<sub>4</sub> alkyl group, a phenyl or benzyl group, or
    - tetrazolyl group.
- R<sub>2</sub> denotes an alkyl chain, or an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl group which may or may not be substituted by at least one OH, OR, SR', NH<sub>2</sub>, NHR', guanidiny, COOH or CONH<sub>2</sub> group, or a halogen atom selected from among F, Cl, Br or I with R' representing a straight-chain or branched C<sub>1-4</sub> alkyl group.
- R<sub>3</sub> denotes a hydrogen atom or a methyl group,
- R<sub>4</sub> denotes
  - an alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub>, PO<sub>3</sub>H<sub>2</sub> or tetrazolyl group, with the groups SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally protected,
  - a C<sub>2-6</sub> alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted

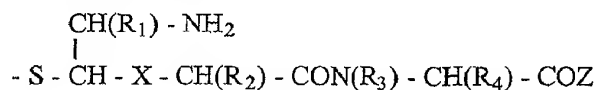
by at least one CO<sub>2</sub>H group optionally protected, or

- R<sub>3</sub> and R<sub>4</sub> may together constitute a 5- or 6-membered heterocyclic compound, substituted by at least one CO<sub>2</sub>H, CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub> or PO<sub>3</sub>H<sub>2</sub> group with the groups CO<sub>2</sub>H, SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally protected,

5      • X denotes a group CONH or CH<sub>2</sub>NH,

    • Z denotes a group OH, OCH<sub>2</sub>-C<sub>6</sub>H<sub>5</sub> or NR"R'" wherein R" and R'" independently of one another may denote a hydrogen atom or an alkyl, aryl or arylalkyl group, where R" and R'" may constitute, together with the nitrogen atom, a 5- or 6-membered heterocycle possibly having a second  
10    heteroatom selected from among O, S and N, and

- R denotes a hydrogen atom or a group of formula II



II

corresponding to the symmetric disulphide of the inhibitor wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, X and Z are as hereinbefore defined,  
15    and the derivatives thereof.

2. The compound according to claim 1, wherein :

- R<sub>4</sub> denotes an alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub>, PO<sub>3</sub>H<sub>2</sub> or tetrazolyl group, with the groups SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally being protected as described above, or

20

- R<sub>4</sub> constitutes with R<sub>3</sub> a 5- or 6-membered heterocyclic compound, substituted by at least one CO<sub>2</sub>H, CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub> or PO<sub>3</sub>H<sub>2</sub> group with the groups CO<sub>2</sub>H, SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally being protected.

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3. The compound according to claim 1, wherein  $R_4$  and  $R_3$  together constitute a 5- or 6-membered, heterocyclic compound substituted by at least one group  $\text{CO}_2\text{H}$ ,  $\text{CONH}_2$ ,  $\text{SO}_3\text{H}$ ,  $\text{SO}_2\text{NH}_2$  or  $\text{PO}_3\text{H}_2$  with the groups  $\text{CO}_2\text{H}$ ,  $\text{SO}_3\text{H}$  and  $\text{PO}_3\text{H}_2$  optionally being protected.

5

4. The compound according to claim 1, wherein X denotes a CONH function.

5. The compound according to claim 1, wherein  $R_2$  denotes an optionally substituted alkyl or arylalkyl chain.

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6. The compound according to claim 1, which is selected from the group consisting in :

N-[(2S,3R)- and (2R,3R)-3-amino-2-mercapto-5-sulphonate] pentanoyl]-  
L.Tyr-L.Sal-OH ;

15

N-[(2S,3R)- and (2R,3R)-3-amino-2-mercapto-5-sulphonate] pentanoyl]-  
L.Tyr-L.hSal-OH ;

N-[(2S,3R)- and (2R,3R)-3-amino-5-carboxy-2-mercapto] pentanoyl]-  
L.Ile-L.(3R)(3-COOH)Pro-OH ;

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N-[(2S,3R)- and (2R,3R)-3-amino-5-phosphonate-2-mercapto]  
pentanoyl]-L.Ile-L.Glu-OH ;

the N-[(2S,3R) and (2R,3R), 3-amino-2-mercapto-5-sulphonate]  
pentanoyl]-L.Ile-L.Sal-OH ;

N-[(2S,3R)- and (2R,3R)-3-amino-2-mercapto-5-sulphonate] pentanoyl]-  
L.Ile-L.(3R)(3-COOH)Pro-OH ;

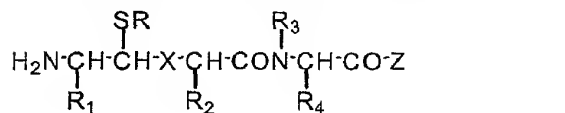
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N-[(2S,3R)- and (2R,3R)-3-amino-2-mercapto-5-sulphonate] pentanoyl]-  
L.Ile-L.(3S)(3-COOH)Pro-OH ; and

N-[(2S,3R)- and (2R,3R)-3-amino-2-mercapto-5-sulphonate] pentanoyl]-  
L.Ile-L.Glu-NH<sub>2</sub>.

0950577.072004

7. A process for preparing a compound of general formula I



wherein

• R<sub>1</sub> denotes an alkyl, alkenyl or alkynyl chain, or a cycloalkyl or (cycloalkyl)alkyl group substituted by at least one

— -COOH group, optionally esterified by an alkyl group comprising 2 to 12 carbon atoms,

— SO<sub>3</sub>H group, optionally protected by a pentyl group,

— PO<sub>3</sub>H<sub>2</sub> group, optionally substituted by a (-CH<sub>2</sub>CH<sub>2</sub>SCOR<sub>5</sub>) group, with R<sub>5</sub> representing a C<sub>1</sub>-C<sub>4</sub> alkyl group, a phenyl or benzyl group, or

— tetrazolyl group.

• R<sub>2</sub> denotes an alkyl chain, or an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl group which may or may not be substituted by at least one OH, OR, SR', NH<sub>2</sub>, NHR', guanidiny, COOH or CONH<sub>2</sub> group, or a halogen atom selected from among F, Cl, Br or I with R' representing a straight-chain or branched C<sub>1-4</sub> alkyl group.

• R<sub>3</sub> denotes a hydrogen atom or a methyl group,

• R<sub>4</sub> denotes

— an alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub>, PO<sub>3</sub>H<sub>2</sub> or tetrazolyl group, with the groups SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally protected,

— a C<sub>2-6</sub> alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one CO<sub>2</sub>H group optionally protected, or

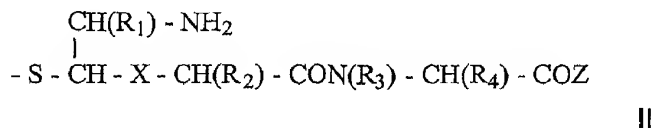
• R<sub>3</sub> and R<sub>4</sub> may together constitute a 5- or 6-membered heterocyclic compound, substituted by at least one CO<sub>2</sub>H, CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub> or

PO<sub>3</sub>H<sub>2</sub> group with the groups CO<sub>2</sub>H, SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally protected,

- X denotes a group CONH,

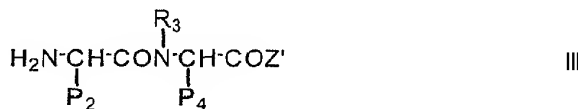
- Z denotes a group OH, OCH<sub>2</sub>-C<sub>6</sub>H<sub>5</sub> or NR<sup>"</sup>R<sup>"'</sup> wherein R<sup>"</sup> and R<sup>"'</sup> independently of one another may denote a hydrogen atom or an alkyl, aryl or arylalkyl group, where R<sup>"</sup> and R<sup>"'</sup> may constitute, together with the nitrogen atom, a 5- or 6-membered heterocycle possibly having a second heteroatom selected from among O, S and N, and

- R denotes a hydrogen atom or a group of formula II



corresponding to the symmetric disulphide of the inhibitor wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, X and Z are as hereinbefore defined,

which involves at least coupling an ester dipeptide of general formula III

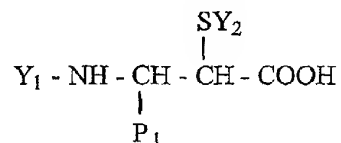


wherein

- P<sub>2</sub> and P<sub>4</sub> correspond to protected forms of R<sub>2</sub> and R<sub>4</sub>,

- Z' denotes an OC(CH<sub>3</sub>)<sub>3</sub>, OCH<sub>2</sub>-C<sub>6</sub>H<sub>5</sub> or NR<sup>"</sup>R<sup>"'</sup> group wherein R<sup>"</sup> and R<sup>"'</sup> independently of one another may denote a hydrogen atom or an alkyl, aryl or arylalkyl group, while R<sup>"</sup> and R<sup>"'</sup> may constitute, together with the nitrogen atom, a 5- or 6-membered heterocycle possibly having a second heteroatom selected from among O, S and N,

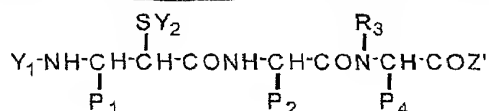
with a compound of general formula IV



IV

wherein :

- $\text{Y}_1$  denotes a protecting group
- $\text{Y}_2$  denotes a protecting group and
- $\text{P}_1$  denotes a protected form of  $\text{R}_1$ ,  
under conditions suitable to produce compound V



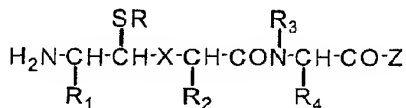
V

and deprotecting it for obtaining said compound of general formula I.

8. The process according to claim 7, wherein the coupling reaction is carried out in an organic solvent in the presence of a coupling agent and a tertiary amine and at a temperature of the order of 20°C.

9. A process according to claim 7, wherein the two asymmetric carbons of the dipeptide ester of general formula III have an S configuration.

10. A process for preparing a compound of general formula I



I

wherein :

- $\text{R}_1$  denotes an alkyl, alkenyl or alkynyl chain, or a cycloalkyl or

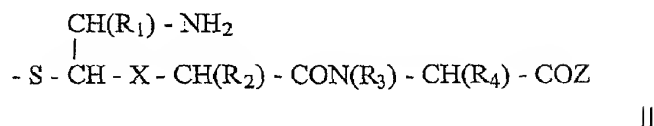
III  
Proc #2  
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(cycloalkyl)alkyl group substituted by at least one

- $\text{-COOH}$  group, optionally esterified by an alkyl group comprising 2 to 12 carbon atoms,
- $\text{SO}_3\text{H}$  group, optionally protected by a pentyl group,
- 5       —  $\text{PO}_3\text{H}_2$  group, optionally substituted by a  $(\text{-CH}_2\text{CH}_2\text{SCOR}_5)$  group, with  $\text{R}_5$  representing a  $\text{C}_1\text{-C}_4$  alkyl group, a phenyl or benzyl group, or
- tetrazolyl group.
- $\text{R}_2$  denotes an alkyl chain, or an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl group which may or may not be substituted
- 10 by at least one  $\text{OH}$ ,  $\text{OR}$ ,  $\text{SR}'$ ,  $\text{NH}_2$ ,  $\text{NHR}'$ , guanidinyl,  $\text{COOH}$  or  $\text{CONH}_2$  group, or a halogen atom selected from among  $\text{F}$ ,  $\text{Cl}$ ,  $\text{Br}$  or  $\text{I}$  with  $\text{R}'$  representing a straight-chain or branched  $\text{C}_{1-4}$  alkyl group.
- $\text{R}_3$  denotes a hydrogen atom or a methyl group,
- 15       •  $\text{R}_4$  denotes
- an alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one  $\text{CONH}_2$ ,  $\text{SO}_3\text{H}$ ,  $\text{SO}_2\text{NH}_2$ ,  $\text{PO}_3\text{H}_2$  or tetrazolyl group, with the groups  $\text{SO}_3\text{H}$  and  $\text{PO}_3\text{H}_2$  optionally protected,
- 20       — a  $\text{C}_{2-6}$  alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one  $\text{CO}_2\text{H}$  group optionally protected, or
- $\text{R}_3$  and  $\text{R}_4$  may together constitute a 5- or 6-membered heterocyclic compound, substituted by at least one  $\text{CO}_2\text{H}$ ,  $\text{CONH}_2$ ,  $\text{SO}_3\text{H}$ ,  $\text{SO}_2\text{NH}_2$  or
- 25  $\text{PO}_3\text{H}_2$  group with the groups  $\text{CO}_2\text{H}$ ,  $\text{SO}_3\text{H}$  and  $\text{PO}_3\text{H}_2$  optionally protected,
- $\text{X}$  denotes a  $\text{CH}_2\text{-NH}$  group,
- $\text{Z}$  denotes a group  $\text{OH}$ ,  $\text{OCH}_2\text{-C}_6\text{H}_5$  or  $\text{NR}''\text{R}'''$  wherein  $\text{R}''$  and  $\text{R}'''$  independently of one another may denote a hydrogen atom or an alkyl, aryl or arylalkyl group, where  $\text{R}''$  and  $\text{R}'''$  may constitute, together with the
- 30 nitrogen atom, a 5- or 6-membered heterocycle possibly having a second

heteroatom selected from among O, S and N, and

- R denotes a hydrogen atom or a group of formula II



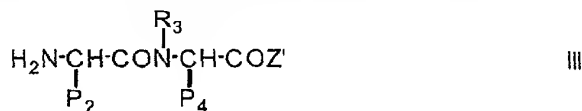
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corresponding to the symmetric disulphide of the inhibitor wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, X and Z are as hereinbefore defined,

which involves at least :

- condensing a compound of general formula III

10



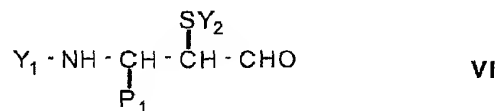
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wherein Z' denotes an OC(CH<sub>3</sub>)<sub>3</sub>, OCH<sub>2</sub>-C<sub>6</sub>H<sub>5</sub> or NR''R''' group with R'' and R''' independently of one another may denote a hydrogen atom or an alkyl, aryl or arylalkyl group, where R'' and R''' may, together with the nitrogen atom, constitute a 5- or 6-membered heterocycle possibly having a second

heteroatom selected from among O, S and N,

with a compound of general formula VI,

20



wherein :

- Y<sub>1</sub> denotes a protecting group
- Y<sub>2</sub> denotes a protecting group and
- P<sub>1</sub> denotes a protected form of R<sub>1</sub>,


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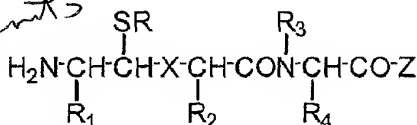
— reducing the intermediate thus formed to produce the compound of general formula VII





11. A process according to claim 9, wherein the two asymmetric carbons of the dipeptide ester of general formula III have an S configuration.

12. Use of a  Use for prep of meso isomer =  $H_2N-C$



- R<sub>1</sub> denotes an alkyl, alkenyl or alkynyl chain, or a cycloalkyl or (cycloalkyl)alkyl group substituted by at least one

- -COOH group, optionally esterified by an alkyl group comprising 2 to 12 carbon atoms,
- SO<sub>3</sub>H group, optionally protected by a pentyl group,
- PO<sub>3</sub>H<sub>2</sub> group, optionally substituted by a (-CH<sub>2</sub>CH<sub>2</sub>SCOR<sub>5</sub>) group, with R<sub>5</sub> representing a C<sub>1</sub>-C<sub>4</sub> alkyl group, a phenyl or benzyl group, or
- tetrazolyl group.

- R<sub>2</sub> denotes an alkyl chain, or an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl group which may or may not be substituted by at least one OH, OR, SR', NH<sub>2</sub>, NHR', guanidiny, COOH or CONH<sub>2</sub> group, or a halogen atom selected from among F, Cl, Br or I with R' representing a straight-chain or branched C<sub>1-4</sub> alkyl group.

• R<sub>3</sub> denotes a hydrogen atom or a methyl group,

• R<sub>4</sub> denotes

– an alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub>, PO<sub>3</sub>H<sub>2</sub> or tetrazolyl group, with the groups SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally protected,

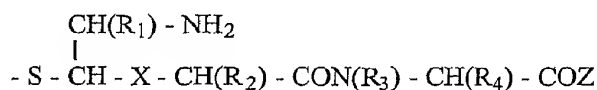
– a C<sub>2-6</sub> alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one CO<sub>2</sub>H group optionally protected, or

• R<sub>3</sub> and R<sub>4</sub> may together constitute a 5- or 6-membered heterocyclic compound, substituted by at least one CO<sub>2</sub>H, CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub> or PO<sub>3</sub>H<sub>2</sub> group with the groups CO<sub>2</sub>H, SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally protected,

• X denotes a group CONH or CH<sub>2</sub>NH,

• Z denotes a group OH, OCH<sub>2</sub>-C<sub>6</sub>H<sub>5</sub> or NR<sup>"</sup>R<sup>"'</sup> wherein R<sup>"</sup> and R<sup>"'</sup> independently of one another may denote a hydrogen atom or an alkyl, aryl or arylalkyl group, where R<sup>"</sup> and R<sup>"'</sup> may constitute, together with the nitrogen atom, a 5- or 6-membered heterocycle possibly having a second heteroatom selected from among O, S and N, and

• R denotes a hydrogen atom or a group of formula II



II

corresponding to the symmetric disulphide of the inhibitor wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, X and Z are as hereinbefore defined,

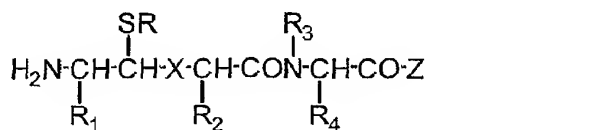
and the derivatives thereof,

as a selective inhibitor of aminopeptidase A.

13. Use according to claim 12 for preparing a medicament intended to reduce food intake, modulate anxiety states or panic attacks or treat essential

and secondary arterial hypertension, cardiac and renal failure, disorders of hydrodynamic homeostasis, myocardial infarct and proteinuria in diabetics.

14. Pharmaceutical composition containing as active ingredient at least one compound of general formula (I) :

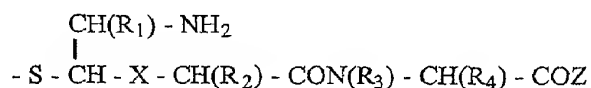


wherein :

- R<sub>1</sub> denotes an alkyl, alkenyl or alkynyl chain, or a cycloalkyl or (cycloalkyl)alkyl group substituted by at least one
  - -COOH group, optionally esterified by an alkyl group comprising 2 to 12 carbon atoms,
  - SO<sub>3</sub>H group, optionally protected by a pentyl group,
  - PO<sub>3</sub>H<sub>2</sub> group, optionally substituted by a (-CH<sub>2</sub>CH<sub>2</sub>SCOR<sub>5</sub>) group, with R<sub>5</sub> representing a C<sub>1</sub>-C<sub>4</sub> alkyl group, a phenyl or benzyl group, or
  - tetrazolyl group.
- R<sub>2</sub> denotes an alkyl chain, or an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl group which may or may not be substituted by at least one OH, OR, SR', NH<sub>2</sub>, NHR', guanidiny, COOH or CONH<sub>2</sub> group, or a halogen atom selected from among F, Cl, Br or I with R' representing a straight-chain or branched C<sub>1-4</sub> alkyl group.
- R<sub>3</sub> denotes a hydrogen atom or a methyl group,
- R<sub>4</sub> denotes
  - an alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub>, PO<sub>3</sub>H<sub>2</sub> or tetrazolyl group, with the groups SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally protected,

— a C<sub>2-6</sub> alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one CO<sub>2</sub>H group optionally protected, or

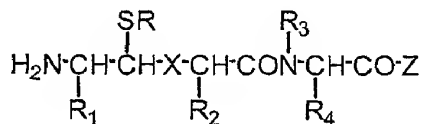
- R<sub>3</sub> and R<sub>4</sub> may together constitute a 5- or 6-membered heterocyclic compound, substituted by at least one CO<sub>2</sub>H, CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub> or PO<sub>3</sub>H<sub>2</sub> group with the groups CO<sub>2</sub>H, SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally protected,
- X denotes a group CONH or CH<sub>2</sub>NH,
- Z denotes a group OH, OCH<sub>2</sub>-C<sub>6</sub>H<sub>5</sub> or NR''R''' wherein R'' and R''' independently of one another may denote a hydrogen atom or an alkyl, aryl or arylalkyl group, where R'' and R''' may constitute, together with the nitrogen atom, a 5- or 6-membered heterocycle possibly having a second heteroatom selected from among O, S and N, and
- R denotes a hydrogen atom or a group of formula II



II

corresponding to the symmetric disulphide of the inhibitor wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, X and Z are as hereinbefore defined, and the derivatives thereof.

15. Diagnostic system for detecting and titrating aminopeptidase A, characterised in that it contains at least one compound of general formula (I):



wherein :

- R<sub>1</sub> denotes an alkyl, alkenyl or alkynyl chain, or a cycloalkyl or (cycloalkyl)alkyl group substituted by at least one

- -COOH group, optionally esterified by an alkyl group comprising 2 to 12 carbon atoms,
- SO<sub>3</sub>H group, optionally protected by a pentyl group,
- PO<sub>3</sub>H<sub>2</sub> group, optionally substituted by a
- 5 (–CH<sub>2</sub>CH<sub>2</sub>SCOR<sub>5</sub>) group, with R<sub>5</sub> representing a C<sub>1</sub>–C<sub>4</sub> alkyl group, a phenyl or benzyl group, or
- tetrazolyl group.

• R<sub>2</sub> denotes an alkyl chain, or an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl group which may or may not be substituted  
 10 by at least one OH, OR, SR', NH<sub>2</sub>, NHR', guanidiny, COOH or CONH<sub>2</sub> group, or a halogen atom selected from among F, Cl, Br or I with R' representing a straight-chain or branched C<sub>1-4</sub> alkyl group.

• R<sub>3</sub> denotes a hydrogen atom or a methyl group,

• R<sub>4</sub> denotes

15 – an alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub>, PO<sub>3</sub>H<sub>2</sub> or tetrazolyl group, with the groups SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally protected,

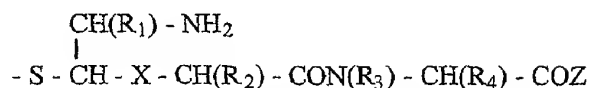
20 – a C<sub>2-6</sub> alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one CO<sub>2</sub>H group optionally protected, or

• R<sub>3</sub> and R<sub>4</sub> may together constitute a 5- or 6-membered heterocyclic compound, substituted by at least one CO<sub>2</sub>H, CONH<sub>2</sub>, SO<sub>3</sub>H, SO<sub>2</sub>NH<sub>2</sub> or PO<sub>3</sub>H<sub>2</sub> group with the groups CO<sub>2</sub>H, SO<sub>3</sub>H and PO<sub>3</sub>H<sub>2</sub> optionally protected,

25 • X denotes a group CONH or CH<sub>2</sub>NH,

• Z denotes a group OH, OCH<sub>2</sub>-C<sub>6</sub>H<sub>5</sub> or NR''R''' wherein R'' and R''' independently of one another may denote a hydrogen atom or an alkyl, aryl or arylalkyl group, where R'' and R''' may constitute, together with the nitrogen atom, a 5- or 6-membered heterocycle possibly having a second  
 30 heteroatom selected from among O, S and N, and

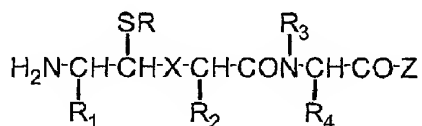
- R denotes a hydrogen atom or a group of formula II



II

- 5 corresponding to the symmetric disulphide of the inhibitor wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, X and Z are as hereinbefore defined, and the derivatives thereof.

16. A method for the prevention or treatment of anxiety states or panic attacks, essential and secondary arterial hypertension, cardiac and renal failure, disorders of hydrodynamic homeostasis, myocardial infarct and proteinuria in diabetics, comprising administering to a patient in need of such treatment a therapeutically efficient amount of a compound of general formula (I) :



I

wherein :

- 20 • R<sub>1</sub> denotes an alkyl, alkenyl or alkynyl chain, or a cycloalkyl or (cycloalkyl)alkyl group substituted by at least one
- -COOH group, optionally esterified by an alkyl group comprising 2 to 12 carbon atoms,
  - SO<sub>3</sub>H group, optionally protected by a pentyl group,
  - 25 — PO<sub>3</sub>H<sub>2</sub> group, optionally substituted by a (-CH<sub>2</sub>CH<sub>2</sub>SCOR<sub>5</sub>) group, with R<sub>5</sub> representing a C<sub>1</sub>-C<sub>4</sub> alkyl group, a phenyl or benzyl group, or
  - tetrazolyl group.

•  $R_2$  denotes an alkyl chain, or an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl group which may or may not be substituted by at least one OH, OR,  $SR'$ ,  $NH_2$ ,  $NHR'$ , guanidiny, COOH or  $CONH_2$  group, or a halogen atom selected from among F, Cl, Br or I with  $R'$  representing a straight-chain or branched  $C_{1-4}$  alkyl group.

•  $R_3$  denotes a hydrogen atom or a methyl group,

•  $R_4$  denotes

— an alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one  $CONH_2$ ,  $SO_3H$ ,  $SO_2NH_2$ ,  $PO_3H_2$  or tetrazolyl group, with the groups  $SO_3H$  and  $PO_3H_2$  optionally protected,

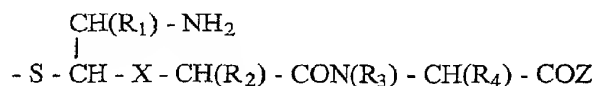
— a  $C_{2-6}$  alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one  $CO_2H$  group optionally protected, or

•  $R_3$  and  $R_4$  may together constitute a 5- or 6-membered heterocyclic compound, substituted by at least one  $CO_2H$ ,  $CONH_2$ ,  $SO_3H$ ,  $SO_2NH_2$  or  $PO_3H_2$  group with the groups  $CO_2H$ ,  $SO_3H$  and  $PO_3H_2$  optionally protected,

• X denotes a group  $CONH$  or  $CH_2NH$ ,

• Z denotes a group OH,  $OCH_2-C_6H_5$  or  $NR''R'''$  wherein  $R''$  and  $R'''$  independently of one another may denote a hydrogen atom or an alkyl, aryl or arylalkyl group, where  $R''$  and  $R'''$  may constitute, together with the nitrogen atom, a 5- or 6-membered heterocycle possibly having a second heteroatom selected from among O, S and N, and

• R denotes a hydrogen atom or a group of formula II

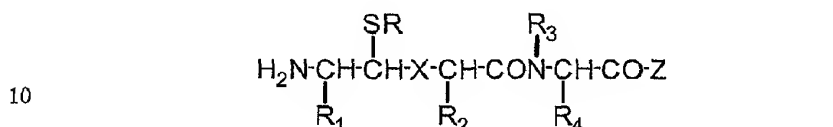


II

corresponding to the symmetric disulphide of the inhibitor wherein  $R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$ , X and Z are as hereinbefore defined,

and the derivatives thereof.

17. A method of diagnosis of anxiety states or panic attacks, essential and secondary arterial hypertension, cardiac and renal failure, disorders of hydrodynamic homeostasis, myocardial infarct and proteinuria in diabetics, wherein the aminopeptidase A is evaluated in a biological sample of a patient to be tested by using a compound of formula (I) :



wherein :

- R<sub>1</sub> denotes an alkyl, alkenyl or alkynyl chain, or a cycloalkyl or (cycloalkyl)alkyl group substituted by at least one
  - -COOH group, optionally esterified by an alkyl group comprising 2 to 12 carbon atoms,
  - SO<sub>3</sub>H group, optionally protected by a pentyl group,
  - PO<sub>3</sub>H<sub>2</sub> group, optionally substituted by a (-CH<sub>2</sub>CH<sub>2</sub>SCOR<sub>5</sub>) group, with R<sub>5</sub> representing a C<sub>1</sub>-C<sub>4</sub> alkyl group, a phenyl or benzyl group, or
  - tetrazolyl group.
- R<sub>2</sub> denotes an alkyl chain, or an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl group which may or may not be substituted by at least one OH, OR, SR', NH<sub>2</sub>, NHR', guanidiny, COOH or CONH<sub>2</sub> group, or a halogen atom selected from among F, Cl, Br or I with R' representing a straight-chain or branched C<sub>1-4</sub> alkyl group.
- R<sub>3</sub> denotes a hydrogen atom or a methyl group,
- R<sub>4</sub> denotes
  - an alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted



by at least one  $\text{CONH}_2$ ,  $\text{SO}_3\text{H}$ ,  $\text{SO}_2\text{NH}_2$ ,  $\text{PO}_3\text{H}_2$  or tetrazolyl group, with the groups  $\text{SO}_3\text{H}$  and  $\text{PO}_3\text{H}_2$  optionally protected,

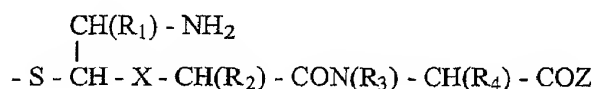
– a  $\text{C}_{2-6}$  alkyl chain, an aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, heterocycloalkyl or (heterocycloalkyl)alkyl group substituted by at least one  $\text{CO}_2\text{H}$  group optionally protected, or

•  $\text{R}_3$  and  $\text{R}_4$  may together constitute a 5- or 6-membered heterocyclic compound, substituted by at least one  $\text{CO}_2\text{H}$ ,  $\text{CONH}_2$ ,  $\text{SO}_3\text{H}$ ,  $\text{SO}_2\text{NH}_2$  or  $\text{PO}_3\text{H}_2$  group with the groups  $\text{CO}_2\text{H}$ ,  $\text{SO}_3\text{H}$  and  $\text{PO}_3\text{H}_2$  optionally protected,

• X denotes a group  $\text{CONH}$  or  $\text{CH}_2\text{NH}$ ,

• Z denotes a group  $\text{OH}$ ,  $\text{OCH}_2\text{-C}_6\text{H}_5$  or  $\text{NR}''\text{R}'''$  wherein  $\text{R}''$  and  $\text{R}'''$  independently of one another may denote a hydrogen atom or an alkyl, aryl or arylalkyl group, where  $\text{R}''$  and  $\text{R}'''$  may constitute, together with the nitrogen atom, a 5- or 6-membered heterocycle possibly having a second heteroatom selected from among O, S and N, and

• R denotes a hydrogen atom or a group of formula II



II

corresponding to the symmetric disulphide of the inhibitor wherein  $\text{R}_1$ ,

$\text{R}_2$ ,  $\text{R}_3$ ,  $\text{R}_4$ , X and Z are as hereinbefore defined,

and the derivatives thereof,

and is compared to the level present in normal subjects.